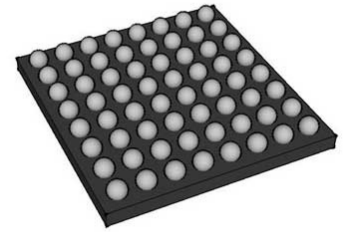


AFE General Purpose 1 ADC 14bit Medical 289-Pin NFBGA

Tray



Images are for reference only

[Inquiry](#)

Manufacturer: [Texas Instruments, Inc](#)

Package/Case: BGA

Product Type: Data Conversion ICs

RoHS: RoHS Compliant/Lead free 

Lifecycle: Active

General Description

The AFE5818 is a highly-integrated, analog front-end (AFE) solution specifically designed for ultrasound systems where high performance and small size are required. The device integrates a complete time-gain-control (TGC) imaging path and a continuous wave Doppler (CWD) path. The device also allows various power and noise combinations to be selected to optimize system performance. Therefore, the AFE5818 is a suitable ultrasound AFE solution for high-end and portable systems

The AFE5818 has a total of 16 channels, with each channel consisting of a voltage-controlled amplifier (VCA), a simultaneous sampling 14-bit and 12-bit analog-to-digital converter (ADC), and a continuous wave (CW) mixer. The VCA includes a low-noise amplifier (LNA), a voltage-controlled attenuator (VCAT), a programmable gain amplifier (PGA), and a low-pass filter (LPF). LNA gain is programmable and supports 250-mVPP to 1-VPP input signals and programmable active termination. The ultra-low noise VCAT provides an attenuation control range of 40 dB and improves overall low-gain SNR, which benefits harmonic and near-field imaging. The PGA provides gain options of 24 dB and 30 dB. In front of the ADC, an LPF can be configured at 10 MHz, 15 MHz, 20 MHz, 30 MHz, 35 MHz, or 50 MHz to support ultrasound applications with different frequencies.

The AFE5818 also integrates a low-power passive mixer and a low-noise summing amplifier to create an on-chip CWD beamformer. 16 selectable phase delays can be applied to each analog input signal. Furthermore, a unique third- and fifth-order harmonic suppression filter is implemented to enhance CW sensitivity

The high-performance, 14-bit ADC achieves 75-dBFS SNR. This ADC ensures excellent SNR at low-chain gain. The device can operate at maximum speeds of 65 MSPS and 80 MSPS, providing a 14-bit and a 12-bit output, respectively.

The ADC low-voltage differential signaling (LVDS) outputs enable a flexible system integration that is desirable for miniaturized systems.

The AFE5818 also allows various power and noise combinations to be selected to optimize system performance. Therefore, the AFE5818 is a suitable ultrasound AFE solution for both high-end and portable systems.

The AFE5818 is available in a 15-mm × 15-mm NFBGA-289 package (ZBV package, S-PBGA-N289) and are specified for operation from -40°C to 85°C. The devices are also pin-to-pin compatible with the AFE5816 device family.

Key Features

16-Channel, Complete Analog Front-End:
LNA, VCAT, PGA, LPF, ADC, and CW Mixer

LNA with Programmable Gain:
Gain: 24 dB, 18 dB, and 12 dB

Linear Input Range: 0.25 VPP, 0.5 VPP, and 1 VPP

Input-Referred Noise: 0.63 nV/ $\sqrt{\text{Hz}}$, 40 MSPS

80 mW/Ch at CW Mode

Excellent Device-to-Device Gain Matching:
 ± 0.5 dB (typical) and ± 1.1 dB (max)

Low Harmonic Distortion

Fast and Consistent Overload Recovery

Passive Mixer for CWD:
Low Close-In Phase Noise: -156 dBc/Hz at 1 kHz Off 2.5-MHz Carrier

Phase Resolution: $\lambda / 16$

Supports 16X, 8X, 4X, and 1X CW Clocks

12-dB Suppression on 3rd and 5th Harmonics

CWD High-Pass Filter Rejects Undesired Low-Frequency Signals < 1 kHz

Small Package: 15-mm \times 15-mm NFBGA-289

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Recommended For You

AFE5807ZCF

Texas Instruments, Inc
BGA

AFE1205E

Texas Instruments, Inc
XX

AFE1104E

Texas Instruments, Inc
SSOP

AFE2124E

Texas Instruments, Inc
SSOP48

AFE4300PNR

Texas Instruments, Inc
LQFP80

AFE1103E

Texas Instruments, Inc
SSOP

AFE4403YZPT

Texas Instruments, Inc
DSBGA36

AFE4403YZPR

Texas Instruments, Inc
DSBGA36

AFE4404YZPR

Texas Instruments, Inc
DSBGA15

AFE4400RHAT

Texas Instruments, Inc
VQFN40

AFE4490RHAT

Texas Instruments, Inc
QFN

AFE4405YZR

Texas Instruments, Inc
DSBGA

AFE4404YZPT

Texas Instruments, Inc
DSBGA15

AFE5808AZCF

Texas Instruments, Inc
BGA

AFE5812ZCF

Texas Instruments, Inc
BGA135